SCIE 1P50
Library Seminar
Fall 2023 term

Ian Gordon

Ian Gordon, Teaching & Learning Librarian

Brock University Library

Term Paper

1. Article Choice – 5%

Choose an original research/study article from a recent peer-reviewed science journal (not earlier than January 2023) from the topics covered in Science 1p50. The article you choose for analysis **may not** be a news summary, a commentary, a letter to the editor, **nor** a review. (No social science/psychology papers). Additionally, you may not use any of the readings used in this course. A copy of your chosen article and a full reference/citation for it (APA or MLA format) is due on Brightspace Monday October 2nd by 11pm. This portion of the term paper is worth **5%** of the course grade. **Failure to submit the article will result in a grade of zero for the assignment.** This is to ensure success in the termpaper by the correct choice of a suitable article. A correct choice will be indicated by your grade on Brightspace, otherwise the seminar leader will email you if it was incorrect and you will have to submit a correct article.

2. Paper – 15%

Write an evaluation of the approved article, **in your own words**, no direct quotes, which must, at least, consider the following questions (~900 words).

Who the researchers are and where do they work?
What is/are the research question(s) the researchers are trying to answer?
Write a summary of the article.
Do you believe the article? Support your opinion.

The paper is due Monday November 6th by 11:00pm on Brightspace. A penalty, of 10% per day of the assignment grade, will be imposed until Friday Nov 10th. No papers will be accepted after this date. Submit the article to your paper - otherwise 3% of the course grade will be deducted. Full details and a mark breakdown for this assignment will be available on Brightspace.

Course Description and Outcomes

Science and the environment are essential parts of our society and lives today. They influence the way we live and work, and they affect the way we understand ourselves and the world around us. Environmental Science includes study of the natural world and its relationships with humans. A selection of topics will narrow our focus and become the basis for the lectures, readings, documentaries, discussions, and assignments.

The outcomes for such a diverse topic will enable the students to explain and analyse some of the most common concepts and theories associated with the major environmental problems facing the world to-day. Students will be able to research, synthesize current research, and communicate both orally and in written format, on the subject and the key topics covered in the course.

Lecture Schedule

	Topics	Readings/Resources
Weeks 1-3	Sustainability & Environmental Hazards	Brightspace: Calculate your Ecological Footprint. Documentary – Trashed Reading: Greenwashing and sustainable fashion industry
Weeks 4 & 5	Resource use & Extraction	Documentary - Anthropocene Reading: Composition & Recycling of Smartphones
Weeks 6 & 7	Costs of Technology	Reading: PFAS in pregnant women Reading: Air pollution & lung function in elite athletes
Weeks 8-10	Climate Change	Reading: IPCC AR6
Weeks 11 &12	Aquatic Ecosystems	Reading: Overview of microplastic pollution

Lecture schedule may be subject to change. All topic readings are on Brightspace.

Related to Course objectives and lectures SCIE 1P50
Not an article in the course readings
Scholarly peer-reviewed journal article
Can’t be a sociology or psychology paper
Not too long… not too short
Published in 2023

Understandable!
Of personal interest
Available for downloading
Handed in by the first week of October 2023
Suitable for the term paper assignment

Habitat degradation, climate change, and environmental pollution affecting Canadian wildlife including polar bears.

Habitat degradation, climate change, and environmental pollution affecting Canadian wildlife including polar bears.

Concept one: Polar bears or Ursus maritimus

Concept two: blood* or contamin* or metal* or habitat or pollut* or lead* or ecotox* or exposure

Concept three: environment* or scien* or sustain* or climate

Concept four: 2023, scholarly, 6-10 pages ideal, scientific, understandable, interesting…

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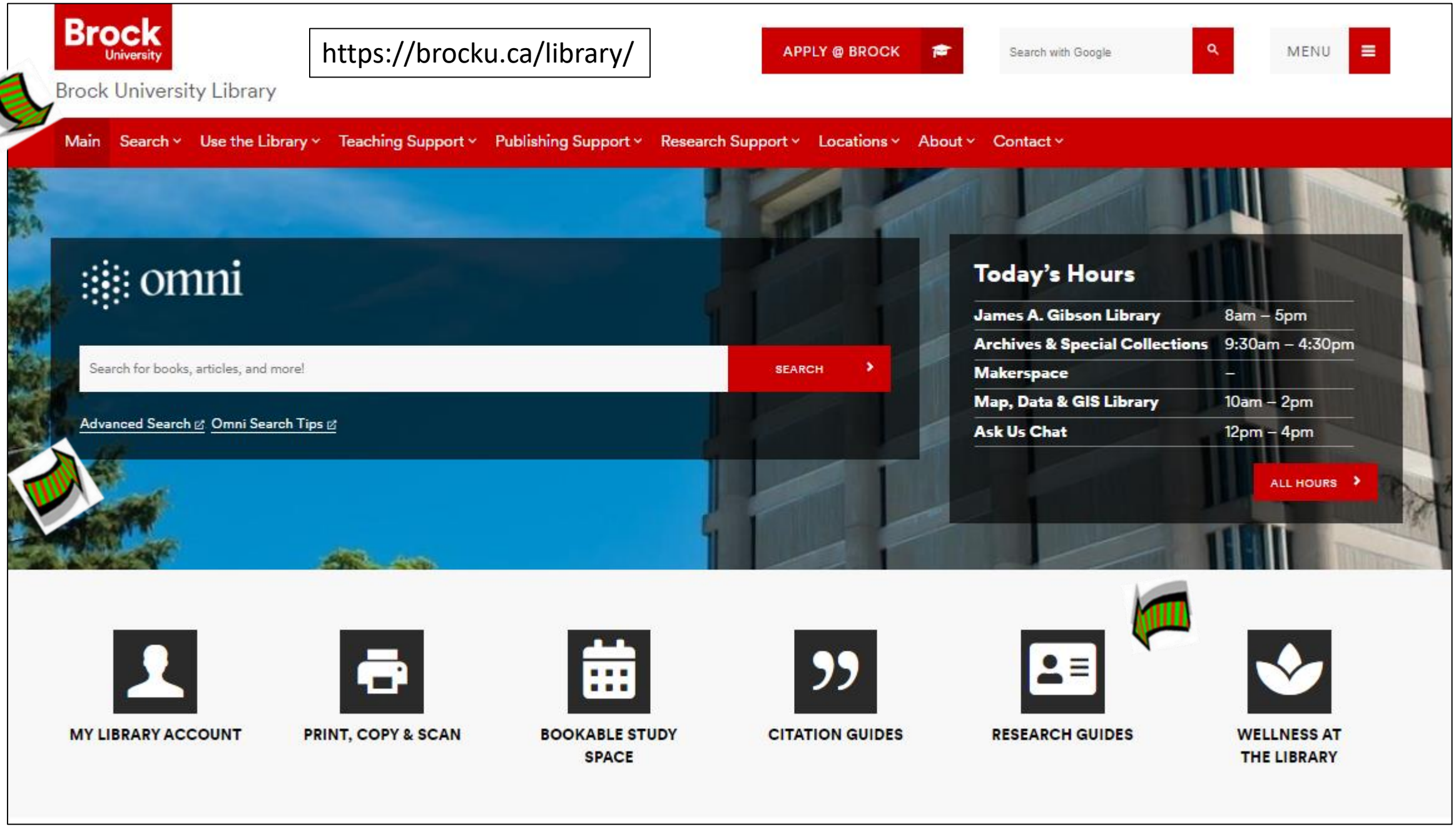
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SCIE 1P50 Fall 2023 slides and video.

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Articles

Journal articles are scholarly works that go through a quality control process called peer-review before they are published.

Note that Web of Science Core Collection includes scholarly peer review articles from important scholarly journals with the ability to limit searches by date, relevance, language, format and importance. A great source for individual articles.

Several databases provide access to regional, national and international news articles.

A select list of databases that include scholarly articles are listed below.

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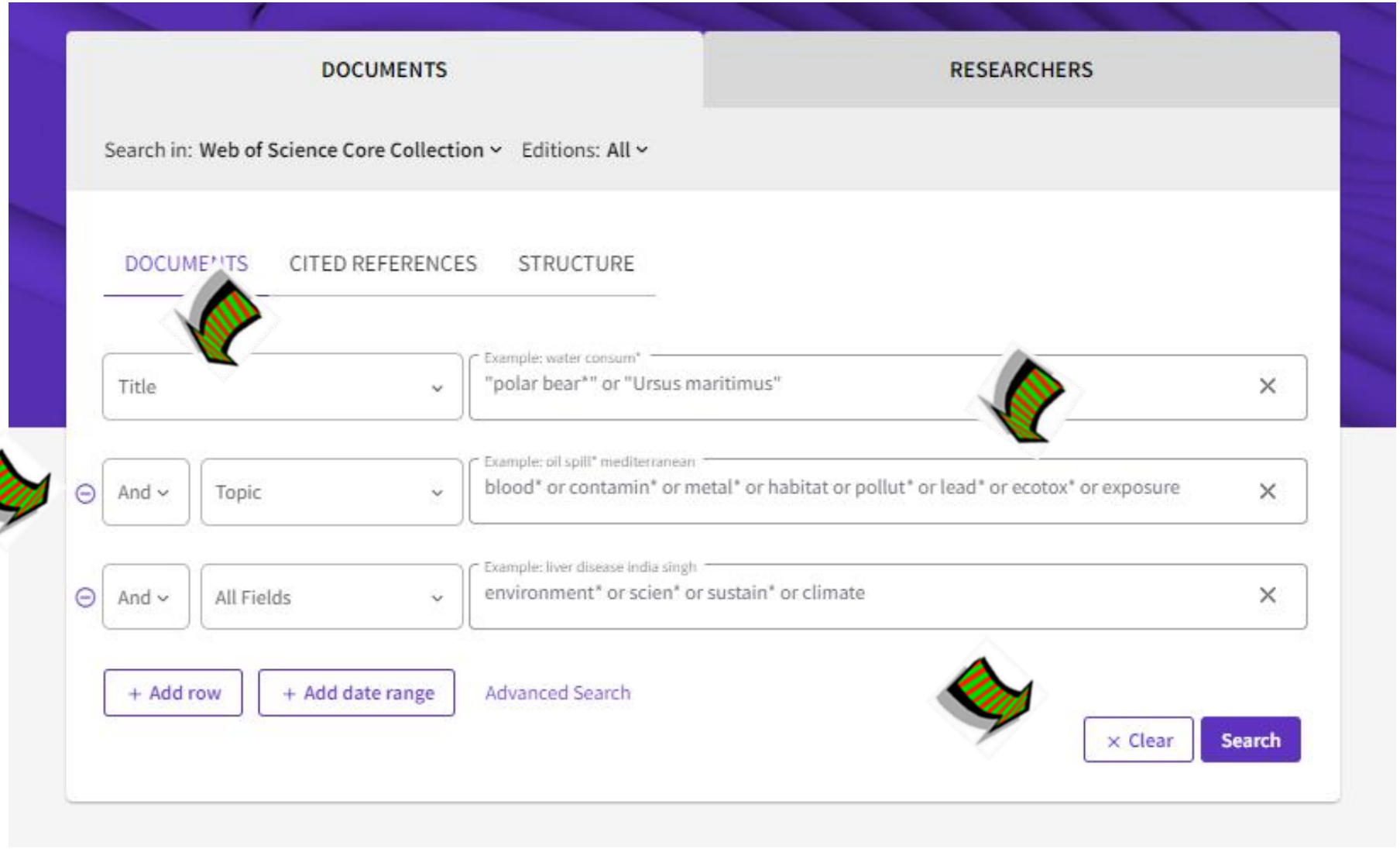

blood*

“Ursus maritimus”

“polar bear*”

And – to combine concepts

or – to include synonyms

Title vs. Topic vs. All Fields

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"polar bear*" or "Ursus maritimus" (Title) and blood* or contamin* or metal* or habitat or pollut* or lead* or ecotox* or exposure (Topic) and environment* or scien* or sustain* or climat...

Search

Add Keywords | Quick add keywords: + URSUS MARITIMUS | + POLAR BEAR | + POLAR BEARS | + POLAR BEAR URSUS MARITIMUS | + ORGANOHALOGEN CONTAMIN

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1 Novel Divergent Polar Bear-Associated Mastadenovirus Recovered from a Deceased Juvenile Polar Bear

Dayaram, A; Tsangaras, K; (...); Greenwood, AD

Jul-aug 2018 | MSPHERE 3 (4)

Polar bears in captivity can be exposed to opportunistic pathogens not present in their natural environments. A 4-month-old polar bear (Ursus maritimus) living in an isolated enclosure with his mother in the Tierpark Berlin, Berlin, Germany, was suffering from severe abdominal pain, mild diarrhea, and loss of appetite and died in early 2017. Histopathology revealed severe hepatic degeneration a ... Show more

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6 Citations

53 References

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2 Polar bears in a warming climate

Derocher, AE; Lunn, NJ and Stirling, I

Annual Meeting of the Society-for-Integrative-and-Comparative-Biology

Apr 2004 | INTEGRATIVE AND COMPARATIVE BIOLOGY 44 (2) , pp.163-176

Polar bears (Ursus maritimus) live throughout the ice-covered waters of the circumpolar Arctic, particularly in near shore annual ice over the continental shelf where biological productivity is highest. However, to a large degree under scenarios predicted by climate change models, these preferred sea ice habitats will be substantially altered. Spatial and temporal sea ice changes will lead to s ... Show more

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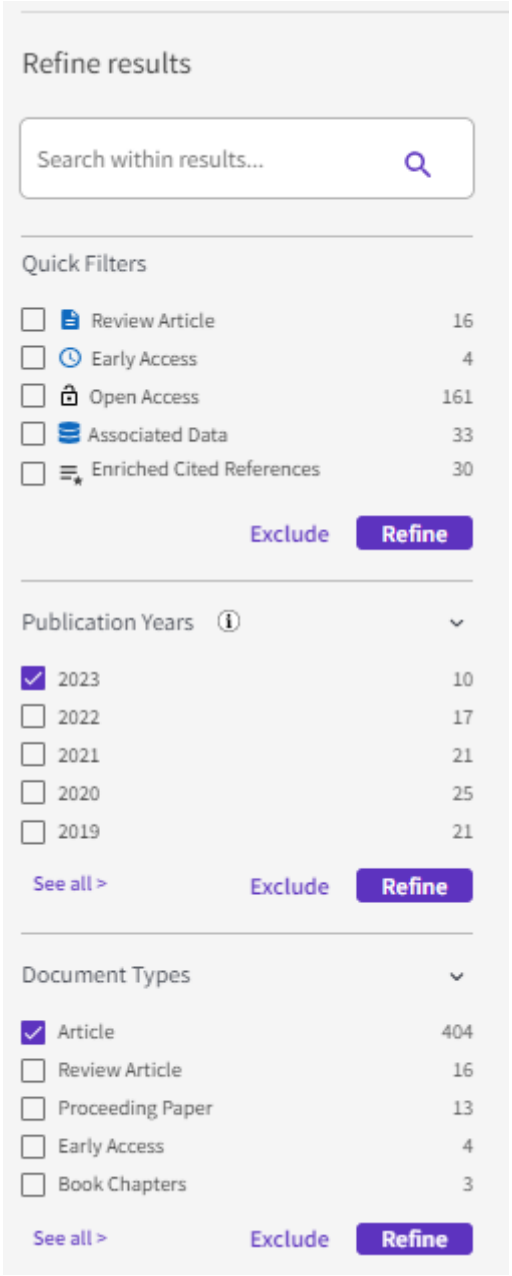

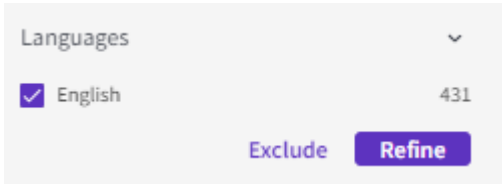

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"polar bear*" or "Ursus maritimus" (Title) and blood* or contamin* or metal* or habitat or pollut* or lead* or ecotox* or exposure (Topic) and environment* or scien* or sustain* or climat...

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1 Relating polar bears killed, human presence, and ice conditions in Svalbard 1987-2019

Vongraven, D; Amstrup, SC; (...); Yoccoz, NG

Jul 28 2023 | FRONTIERS IN CONSERVATION SCIENCE 4

Enriched Cited References

Conflicts between humans and polar bears have been predicted to increase as polar bear prime habitat, sea ice, is decreasing. In Svalbard, a strict protection and control schemes have secured near complete records of bears killed and found dead since 1987. We analyzed the trend in the number of kills and related this to human visitation to the archipelago. We found a slight decrease in the numb ... Show more

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2 Long-term assessment of relationships between changing environmental conditions and the physiology of southern Beaufort Sea polar bears (Ursus maritimus)

Fry, TL; Friedrichs, KR; (...); Atwood, TC

Jul 2023 (Early Access) | GLOBAL CHANGE BIOLOGY

Enriched Cited References

Climate change is influencing polar bear (Ursus maritimus) habitat, diet, and behavior but the effects of these changes on their physiology is not well understood. Blood-based biomarkers are used to assess the physiologic health of individuals but their usefulness for evaluating population health, especially as it relates to changing environmental conditions, has rarely been explored. We descri ... Show more

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Testosterone and persistent organic pollutants in East Greenland male polar bears (Ursus maritimus)

Ciesielski, TM; Sonne, C; (...); Jenssen, BM

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References

Legacy persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs) are chemicals that undergo long-range transport to the Arctic. These chemicals possess endocrine disruptive properties raising concerns for development and reproduction. Here, we report the relationship between concentrations of testosterone (T) and persistent organic pollutant (POPs) in 40 East Greenland male ... Show more

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Testosterone and persistent organic pollutants in East Greenland male polar bears (Ursus maritimus)

By Ciesielski, TM (Ciesielski, Tomasz M.) [1] ; Sonne, C (Sonne, Christian) [2] ; Smette, EI (Smette, Eli I.) [1] ; Villanger, GD (Villanger, Gro Dehli) [1] , [3] ; Styrishave, B (Styrishave, Bjarne) [4] ; Letcher, RJ (Letcher, Robert J.) [5] ; Hitchcock, DJ (Hitchcock, Daniel J.) [6] ; Dietz, R (Dietz, Rune) [2] ; Jenssen, BM (Jenssen, Bjorn M.) [7]

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Journal HELIYON

Volume: 9 Issue: 3

DOI: 10.1016/j.heliyon.2023.e13263

Article Number e13263

Published MAR 2023

Early Access APR 2023

Indexed 2023-04-28

Document Type Article

Abstract Legacy persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs) are chemicals that undergo long-range transport to the Arctic. These chemicals possess endocrine disruptive properties raising concerns for development and reproduction. Here, we report the relationship between concentrations of testosterone (T) and persistent organic pollutant (POPs) in 40 East Greenland male polar bears (Ursus maritimus) sampled during January to September 1999-2001. The mean +/- standard concentrations of blood T were 0.31 +/- 0.49 (mean +/- SD) ng/ mL in juveniles/subadults (n = 22) and 3.58 +/- 7.45 ng/mL in adults (n = 18). The n-ary sumation POP concentrations (mean +/- SD) in adipose tissue were 8139 +/- 2990 ng/g lipid weight (lw) in juveniles/subadults and 11,037 +/- 3950 ng/g lw in adult males, respectively, of which sigma polychlorinated biphenyls (sigma PCBs) were found in highest concentrations. The variation in T concentrations explained by sampling date (season), biometrics and adipose tissue POP concentrations was explored using redundancy analysis (RDA). The results showed that age, body length, and adipose lipid content in adult males contributed (p = 0.02) to the variation in POP concentrations. However, although some significant relationships between individual organochlorine contaminants and T concentrations in both juveniles/subadults and adult polar bears were identified, no significant relationships (p = 0.32) between T and POP concentrations were identified by the RDAs. Our results suggest that confounders such as biometrics and reproductive status may mask the endocrine disruptive effects that POPs have on blood T levels in male polar bears, demonstrating why it can be difficult to detect effects on wildlife populations.

Keywords **Author Keywords:** Arctic; Endocrine disruption; POPs; Reproductive organs; PCBs; Seasonal hormone levels

Keywords Plus: DOGS CANIS-FAMILIARIS; 3 DECADES 1983-2010; POLYCHLORINATED-BIPHENYLS; CONTAMINANT EXPOSURE; CIRCULATING STEROIDS; POP EXPOSURE; BLOOD-PLASMA; VITAMIN-A; TRENDS; HORMONES

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3. Results

4. Discussion

5. Conclusions

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Declaration of interest's statement

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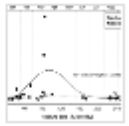
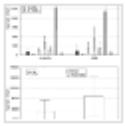

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Volume 9, Issue 3, March 2023, e13263

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Testosterone and persistent organic pollutants in East Greenland male polar bears (*Ursus maritimus*)

Tomasz M. Ciesielski [a], Christian Sonne [b], Eli I. Smette [a], Gro Dehli Villanger [a c], Bjarne Styrishave [d], Robert J. Letcher [e], Daniel J. Hitchcock [f], Rune Dietz [b], Bjørn M. Jenssen [a b g]

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Abstract

Legacy persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs) are chemicals that undergo long-range transport to the Arctic. These chemicals possess endocrine disruptive properties raising concerns for development and reproduction. Here, we report the relationship between concentrations of testosterone (T) and persistent organic pollutant (POPs) in 40 East Greenland male polar bears (*Ursus maritimus*) sampled during January to September 1999–2001. The mean±standard concentrations of blood T were 0.31±0.49 (mean±SD) ng/mL in juveniles/subadults (n=22) and 3.58±7.45 ng/mL in adults (n=18). The ∑POP concentrations (mean±SD) in adipose tissue were 8139±2990 ng/g lipid weight (lw) in juveniles/subadults and 11,037±3950 ng/g lw in adult males, respectively, of which Σpolychlorinated biphenyls (ΣPCBs) were found in highest concentrations. The variation in T concentrations

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Research article

Testosterone and persistent organic pollutants in East Greenland male polar bears (*Ursus maritimus*)

Tomasz M. Ciesielski [a,*], Christian Sonne [b,**], Eli I. Smette [a], Gro Dehli Villanger [a,c], Bjarne Styrishave [d], Robert J. Letcher [e], Daniel J. Hitchcock [f], Rune Dietz [b], Bjørn M. Jenssen [a,b,g]

[a] Department of Biology, Norwegian University of Science and Technology, Høgskoleringen 5, NO-7491 Trondheim, Norway
[b] Department of Ecoscience, Arctic Research Centre, Aarhus University, Frederiksborgvej 399, PO Box 358, DK-4000 Roskilde, Denmark
[c] Mental and Physical Health, Department of Child Health and Development, Norwegian Institute of Public Health, PO Box 222 Skoyen, NO-0213 Oslo, Norway
[d] Toxicology and Drug Metabolism Group, Department of Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, DK-2100, Denmark
[e] Ecotoxicology and Wildlife Health Division, Science and Technology Branch, Environment and Climate Change Canada, National Wildlife Research Centre, Carleton University, Ottawa, ON, K1S 5B6, Canada
[f] Department of Biosciences, University of Oslo, NO-0316 Oslo, Norway
[g] Department of Arctic Technology, The University Centre in Svalbard, PO Box 156, NO-9171 Longyearbyen, Norway

ARTICLE INFO

Keywords:
Arctic
Endocrine disruption
POPs
Reproductive organs
PCBs
Seasonal hormone levels

ABSTRACT

Legacy persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs) are chemicals that undergo long-range transport to the Arctic. These chemicals possess endocrine disruptive properties raising concerns for development and reproduction. Here, we report the relationship between concentrations of testosterone (T) and persistent organic pollutant (POPs) in 40 East Greenland male polar bears (*Ursus maritimus*) sampled during January to September 1999–2001. The mean ± standard concentrations of blood T were 0.31 ± 0.49 (mean ± SD) ng/mL in juveniles/subadults (n = 22) and 3.58 ± 7.45 ng/mL in adults (n = 18). The ∑POP concentrations (mean ± SD) in adipose tissue were 8139 ± 2990 ng/g lipid weight (lw) in juveniles/subadults and 11,037 ± 3950 ng/g lw in adult males, respectively, of which Σpolychlorinated biphenyls (ΣPCBs) were found in highest concentrations. The variation in T concentrations explained by sampling date (season), biometrics and adipose tissue POP concentrations was explored using redundancy analysis (RDA). The results showed that age, body length, and adipose lipid content in adult males contributed (p = 0.02) to the variation in POP concentrations. However, although some significant relationships between individual organochlorine contaminants and T concentrations in both juveniles/subadults and adult polar bears were identified, no significant relationships (p = 0.32) between T and POP concentrations were identified by the RDAs. Our results suggest that confounders such as biometrics and reproductive status may mask the endocrine disruptive effects that POPs have on blood T levels in male polar bears, demonstrating why it can be difficult to detect effects on wildlife populations.

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** Corresponding author.
E-mail addresses: tomasz.m.ciesielski@ntnu.no (T.M. Ciesielski), cs@ecos.au.dk (C. Sonne).

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2. Paper – 15%

Write an evaluation of the approved article, **in your own words**, no direct quotes, which must, at least, consider the following questions (~900 words).

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What is/are the research question(s) the researchers are trying to answer?
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Do you believe the article? Support your opinion.

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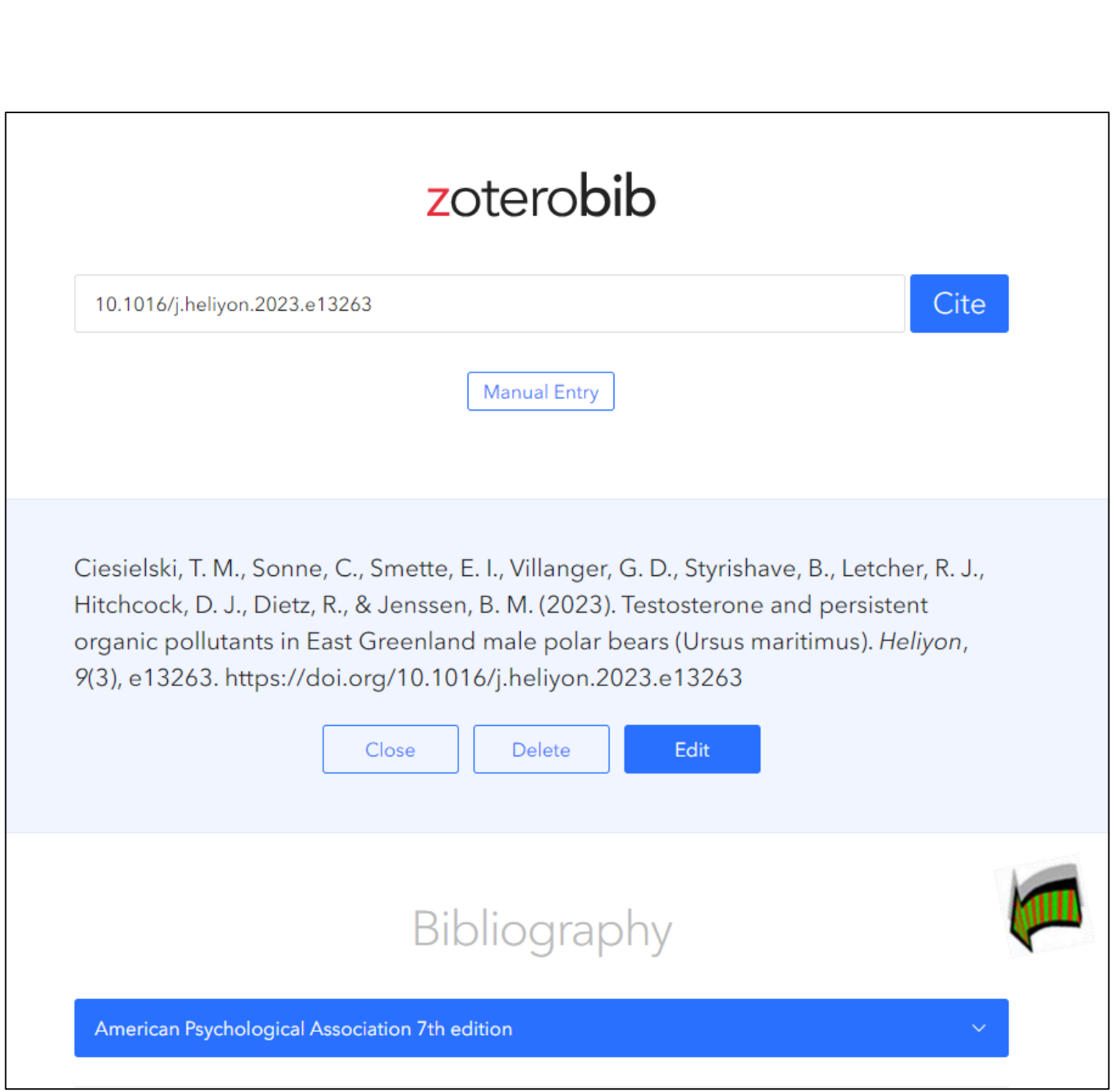
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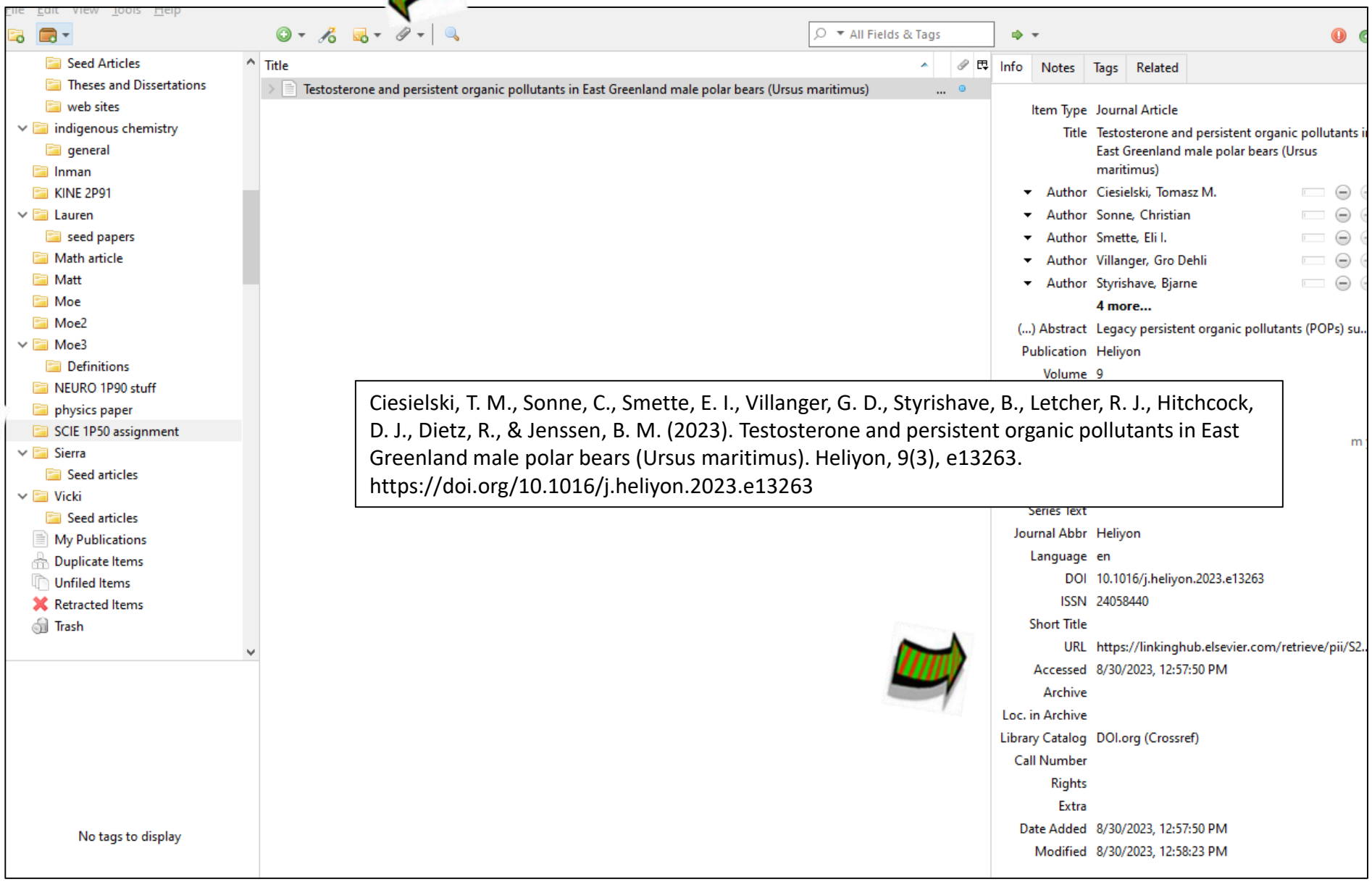

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Term Paper

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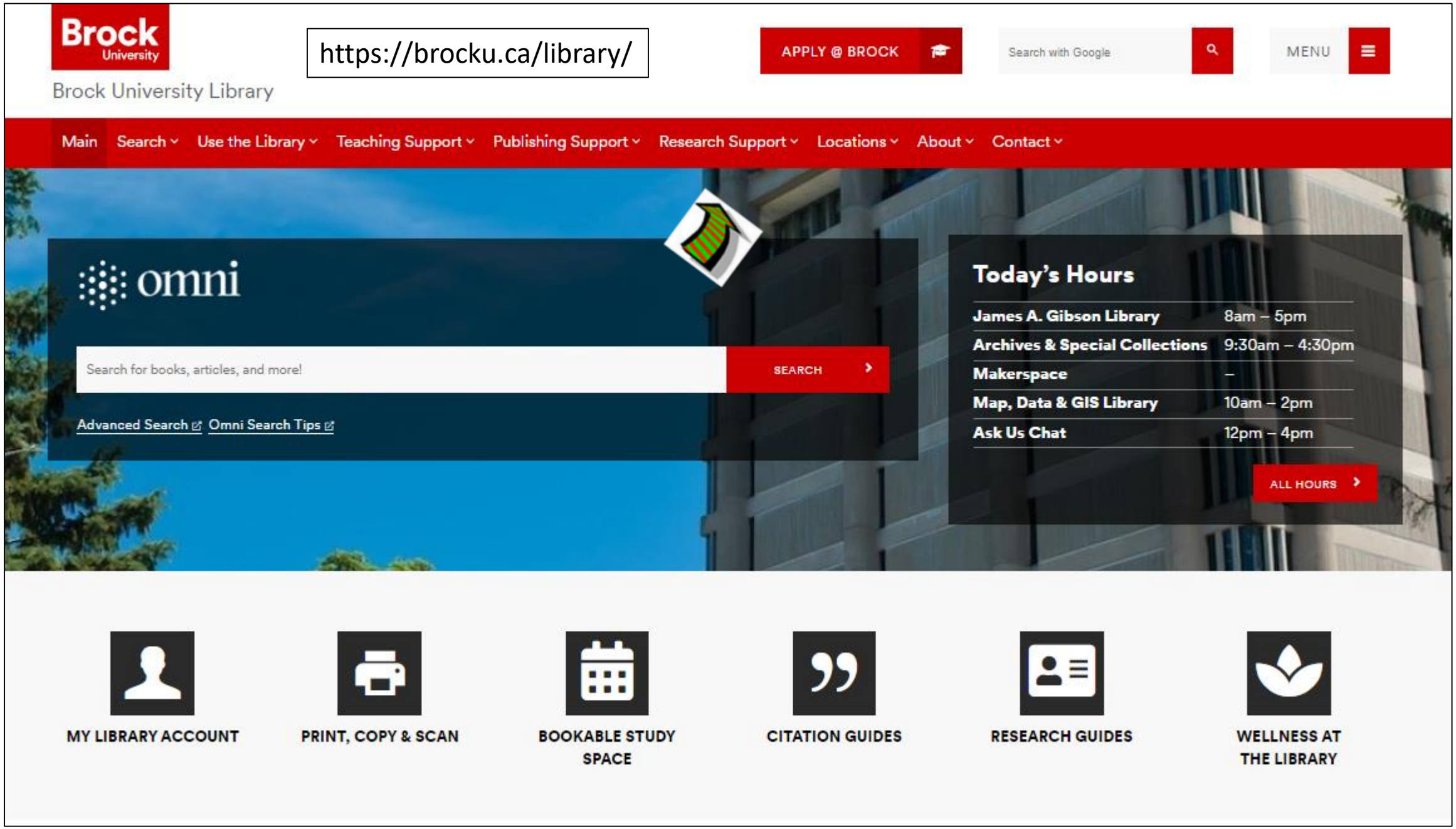
Do you believe the article? Support your opinion.

The paper is due Monday November 6th by 11:00pm on Brightspace. A penalty, of 10% per day of the assignment grade, will be imposed until Friday Nov 10th. No papers will be accepted after this date. Submit the article to your paper - otherwise 3% of the course grade will be deducted. Full details and a mark breakdown for this assignment will be available on Brightspace.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SCIE 1P50 Fall 2023 slides and video.

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3. Select Time:

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Time Zone: Eastern Time - US & Canada (change)

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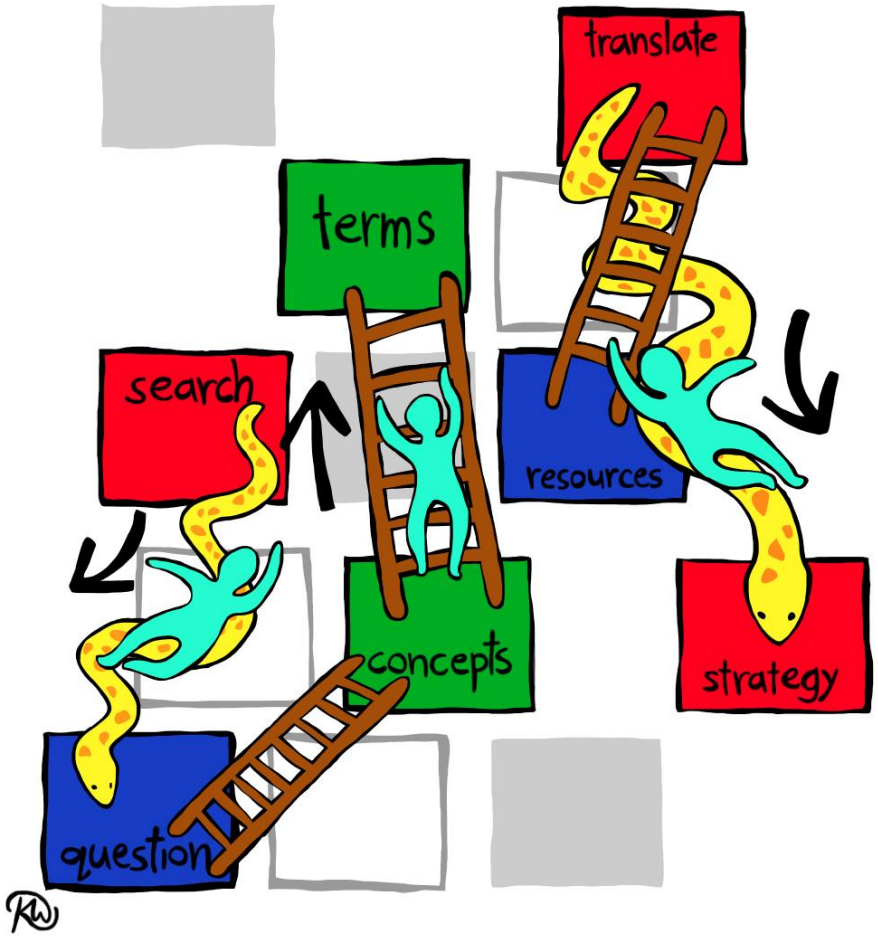

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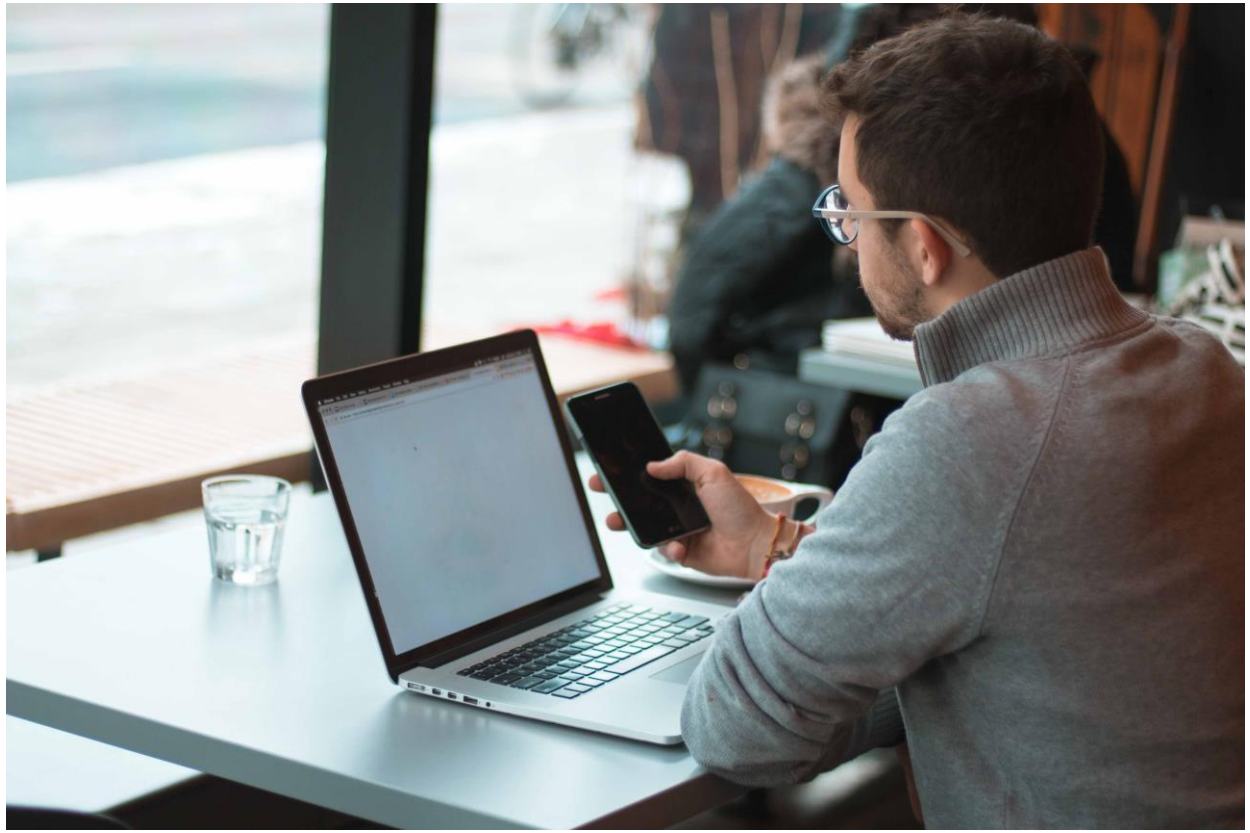

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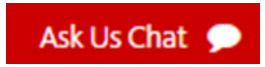

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